Seventy-one out of the 126 Councils had expended on, or appropriated to, Technical or Intermediate Education the whole of the moneys they had received from the residue of the Beer and Spirit Duties.

SOCIETIES AND ACADEMIES.

London.

Physical Society, February 8.—Annual General Meeting.—The chair was taken by the retiring President, Prof. Rücker.—The Treasurer, Dr. Atkinson, presented his report for the year 1894. The balance-sheet showed a somewhat larger expenditure than in previous years, the increase being partly due to the new system of publishing abstracts, partly to the rent of rooms and the expenses of tea. The balance in the bank had increased by about £33 during the year; but the Treasurer said that, strictly speaking, the Society had trenched on its capital to the extent of about £30, and that this would probably be the last report for some time to come which would show a balance in favour of the Society. The assets of the Society exceeded its liabilities by £2642 0*s.* 5*d.* Prof. Carey Foster asked whether it would not be possible, in estimating the assets of the Society, to make some allowance for the stock in hand. Dr. Atkinson replied that that had not hitherto been done, and the difficulty would be to assign a money value to the stock. The stock of the works of Joule, and of other memoirs, was of course decreasing, while the sale of the *Proceedings* was becoming somewhat greater. As regarded the securities of the Society, their actual value would be about £200 or £300 more than appeared on the balance-sheet. Prof. Rücker said that the Society had deliberately entered upon a policy of expansion, and that they must be prepared to find the expenditure increasing. On the other hand, it was hoped that by making the Society more attractive, a greater number of persons would be induced to join. In view of the great advantages now enjoyed by members, there had been some suggestion of raising the subscription; but, in any case, he thought that they might look forward to the future with confidence. The report was then moved and adopted.—The next business was the election of Officers and Council for the year 1895-6, and Messrs. Rhodes and Yule, being asked to act as scrutators, collected the balloting lists.—Prof. Carey Foster proposed a vote of thanks to the Lords of the Committee of the Council on Education, for having allowed the Society to meet at the Royal College of Science. At the commencement of the life of the Society, its founder and first President, Guthrie, had obtained permission for the meetings to take place at South Kensington, and the Society had continued to meet there until their recent migration to the rooms of the Chemical Society. The vote of thanks was duly seconded and was carried unanimously. Major-General Festing then proposed, and Mr. Croft seconded, a vote of thanks to the auditors, Messrs. Inwards and Trotter. This also was carried. Mr. Trotter then proposed a vote of thanks to the retiring Council; they had shown an energy which was rare in such societies, and had inaugurated an active and original policy, which must prove of the greatest benefit to the Physical Society and to physical science generally. Carried unanimously.—Mr. Elder gave notice of a proposed alteration of the rules, the object being to allow the Council under certain conditions to admit persons into the Society without requiring from them the usual number of recommendations from members. It was pointed out that sometimes eligible persons, especially those resident abroad, were unable to enter the Society because they were unknown to any of the existing members. The motion to sanction the proposed alteration was put from the chair and carried, but this decision will need to be confirmed at a subsequent meeting, of which due notice will be given.—Mr. Rhodes then read the following list of the Officers and Council elected for the year 1895-6: President, Capt. Abney. Vice-Presidents who have filled the office of President: Dr. Gladstone, Profs. Carey Foster and Adams, Lord Kelvin, Profs. Clifton, Reinold, Ayrton, Fitzgerald, Rücker. Vice-Presidents: Mr. W. Baily, Major-General Festing, Prof. Perry, Dr. Stoney. Secretaries: Messrs. Blakesley and Elder. Treasurer: Dr. Atkinson. Demonstrator: Prof. Boys. Other members of Council: Mr. Shelford Bidwell, Mr. W. Crookes, Messrs. Fletcher, Glazebrook, G. Griffith, Profs. Henrici, Minchin, Mr. Swinburne, Profs. S. P. Thompson and S. Young.—Prof. Rücker then vacated the chair in favour of Captain Abney, and the meeting being resolved into an ordinary meeting, Mr. W. B. Croft gave "an exhibition of simple apparatus." An optical bench was shown which consisted of a wooden lath of rectangular section, furnished with a millimetre scale, and clamped on to the table, together with three flat wooden blocks, whose contacts with the table and the lath left them only freedom to slide in a direction parallel to the scale. Another apparatus was designed for observing anomalous dispersion. A cork supported two rectangular pieces of microscope cover-glass, which were inclined at a small angle to one another; and a drop or two of a strong alcoholic solution of fuchsine being introduced between them was maintained in position by capillary action. Photographs were shown of Chladni's sand-figures, some of the forms being of an unusual character. Mr. Croft also exhibited a polariscope in which the polariser was a thin piece of glass stuck on to cork by means of black sealing-wax, and the analyser a plate of tourmaline; as well as a miniature model of Grove's gas battery. Photographs of some curious optical phenomena were projected on the screen, including 12-rayed stars seen on looking at a bright source of light through certain specimens of mica, and pairs of intersecting or non-intersecting circles of light, obtained under similar circumstances with (doubly-refracting) fibrous calcite. These last, it was suggested were similar in origin to the curves obtained by reflection at, or transmission through, a diffraction-grating held obliquely. Clock-springs broken by frost were also exhibited, each spring having given way in a very great number of places simultaneously. Dr. Johnstone Stoney said that many years ago he had published in the *Transactions* of the Royal Irish Academy an investigation of the circles seen in fibrous calcite, and had shown geometrically that they had nothing to do with the regularity of the fibrous structure, but were due to reflection and refraction within the crystalline plate. The distribution of the planes of polarisation round the circumferences of the circles was also accounted for by his investigations. Mr. Price said he had found that when a clock-spring during the process of hardening was kept in shape by wires, subsequent fracture was most apt to occur at those places where the wires had been in contact with the spring.—Mr. Rhodes asked if Mr. Croft had ever tried Newton's experiment of admitting sunlight between two sharp edges inclined at a small angle to one another. He had not been able to obtain the hyperbolic bands described by Newton. Mr. Croft said he had not tried the experiment exactly in that form. Captain Abney said that this experiment had succeeded very well in his hands.—Mr. S. Skinner read a paper on the tin chromic chloride cell. He said that his attention had been attracted to the cell by an account published by Mr. Case, of New York. The cell had been stated to give no E.M.F. at ordinary room-temperatures, while it gave a considerable E.M.F. at 100° C. The author had found that when the cell was directly connected up to a galvanometer, there was no current at ordinary temperatures, and some current at 100° C.; but when he had measured the E.M.F. by Poggendorff's method, he had found ·44 volt at 15° C. and ·40 volt at 97° C. The cell as originally described consists of a tin plate and a platinum plate immersed side by side in a solution of chromic chloride; when the temperature of the cell is near to 100° C., and the poles are connected, the following reaction occurs:—

$$Cr_2Cl_6 + Sn = 2CrCl_2 + SnCl_2;$$

and when the poles are disconnected and the cell cooled, the reverse change takes place. The author prefers to use as electropositive metal an amalgam of tin and mercury instead of a tin plate, so that when the tin precipitated during cooling falls to the bottom of the solution, it is redissolved in the mercury, and the cell has regained its original state. When silver nitrate solution is added to chromic chloride, only two-thirds of the chlorine comes down as silver chloride, and this has led the author to suppose that the proper formula for chromic chloride is $CrCl \,.\, Cl_2$. Hence he works out the electrolytic action by means of a Grotthus chain. Prof. Rücker asked whether a change of polarisation would explain the behaviour of a cell at different temperatures. Prof. Carey Foster asked whether the reversed chemical action on cooling from a high temperature were accompanied by a reversed E.M.F. Mr. Skinner said no. The tin was precipitated throughout the solution, and not at the surface of the tin plate, so that no E.M.F. of the kind was to be expected. Mr. Appleyard thought that Prof. Minchin had used tin chloride cells with two tin plates for electrodes, the

© 1895 Nature Publishing Group

cells only working when one plate was illuminated. Mr. Trotter wished to know whether heating the cell supplied energy to it, or simply removed an obstacle in the form of polarisation. Mr. Skinner thought that heating acted by removing an obstacle. Captain Abney: And so doing work.

PARIS.

Academy of Sciences, February 4.—M. Marey in the chair.—The proceedings were commenced by the announcement of the decease of Prof. Arthur Cayley, correspondent of the Astronomy Section from 1863. M. Hermite then gave a short account of the scientific work of the great mathematician.—On argon, a new constituent of the atmosphere, discovered by Lord Rayleigh and Prof. Ramsay. An abstract by M. Berthelot of matter that has already appeared in these columns. He concludes with the observation that, although argon has no action on the higher animals, it cannot be predicted that bacteria may not be affected by it, for it is known that they absorb nitrogen. The suggestion is made that nitrogen obtained from the total destruction of animal or vegetable matter should be examined for argon.—On abelian functions, by M. H. Poincaré.—Propellers with tangential penetration, by M. Guyou. A description of a model of a new type of propeller.—The present state of investigations on the vegetation of French colonies and protectorates, by M. Ed. Bureau.—On a passage of the shadow of Jupiter's fourth satellite, by M. J. J. Landerer. The calculated time of half-passage is 27m. 9s.; observation gives the time as 21m. 30s.—Solar observations made at Lyons Observatory during the fourth quarter of 1894, by M. J. Guillaume. There appears to have been a general decrease of spots and faculæ since the first quarter of 1893.—On continuous straight beams rigidly connected with their supports, by M. Eugène Laye.—On the nature of the "displacement current" of Maxwell, by M. Vaschy. A mathematical paper in which the author shows that certain properties admitted by Maxwell as hypotheses are mathematically exact, and may be deduced from his theory.—On the anomalous rotatory dispersion of crystallised absorbent media, by M. G. Moreau.—On Fresnel's biprism, by M. Georges Meslin.—Influence of low temperatures on the attractive power of artificial permanent magnets, by M. Raoul Pictet. The tabulated mean results of four sets of experiments, agreeing well together, show a continuously increasing attractive power as the temperature becomes lower. The range of temperature in these experiments was from + 30° to − 105°.—Moniodammonium derivatives of hexamethyltriamidotriphenylmethane, by M. A. Rosenstiehl. Methyl iodide forms with the complex triamines A_3:C.R (where A represents $(CH_3)_2.N.C_6H_4$, and R indicates an electropositive radical such as H, OH, or OCH_3) two series of colourless combinations. (1) The first contains one atom of pentavalent nitrogen. Compounds of this class exchange the radical R for an acid radical, and form colouring matters. (2) The second series, formed by the addition of three molecules of methyl iodide, contains three pentavalent nitrogen atoms. Colouring matters are not formed in this case, as the radical R cannot be exchanged for an acid radical.—On laccase and the oxidising power of this diastase, by M. G. Bertrand.—Reactions of chelidonine with the phenols in sulphuric solution, by M. Battandier. With a drop of guaiacol dissolved in 0·5 c.c. of concentrated sulphuric acid, chelidonine moistened and exposed to the air gives a fine carmine colouration. A list of colour reactions with other phenols is given.—On the development of the body in the shrimp (*Palemon serratus*, Fabr.) and the crayfish (*Astacus fluviatilis*, Gesn.), by M. Louis Roule.—On the production of females and males among the Meliponas, by M. J. Perez.—On the influence of climatological conditions on the growth of trees, by M. Emile Mer. The author shows that the dryness of 1893 caused a diminution in the growth of wood in forest trees. A similar effect was produced by the excessive rainfall of 1888.—On refraction in polychroic aureoles, by M. A. Michel-Lévy. When the aureoles are well developed, with free contours, deeply coloured, the refraction of the pigmented part is clearly superior to that of the unmodified substance. The difference between the similar indices of refraction may amount to a decimal of the second order. It follows that the constitution of the mineral is profoundly modified, as its ellipsoid of optical elasticity is different.—On the existence of numerous remains of sponges in the *phtanites* of the Precambrian of Brittany, by M. L. Cayeux. Conclusions: (1) There exist, at the base of the Precambrian of Brittany, numerous and varied sponge spicules. (2) Almost all, if not all, the orders of sponges with siliceous skeletons are represented at this early epoch.—On the existence of a submarine delta in the Upper Cretaceous near Châtillon-en-Diois, by MM. G. Sayn and P. Lory.

BOOKS, PAMPHLETS, and SERIALS RECEIVED.

BOOKS.—The Foundations of Belief: A. J. Balfour (Longmans).—Cellulose: Cross and Bevan (Longmans).—Thoughts on Religion: Dr. G. J. Romanes (Longmans).—Elementary Lessons in Electricity and Magnetism: Prof. S. P. Thompson, new edition (Macmillan).—Remarkable Comets: W. T. Lynn, 3rd edition (Stanford).—Varied Occupations in Weaving: L. Walker (Macmillan).—Theoretical Chemistry from the Standpoint of Avogadro's Rule and Thermodynamics: Prof. W. Nernst, translated by Prof. C. S. Palmer (Macmillan).—Atlas of Classical Antiquities: Th. Schreiber, edited for English Use by Prof. W. C. F. Anderson (Macmillan).—Annuaire de L'Observatoire Royale de Belgique, 1895: F. Folie (Bruxelles, Hayez).—Alembic Club Reprints; No. 10, Researches on the Arseniates, Phosphates, and Modifications of Phosphoric Acid: T. Graham (Edinburgh, Clay).—Die Bearbeitung des Glases auf dem Blasetische: D. Djakonow and W. Lermantoff (Berlin, Friedländer).—A Treatise on Industrial Photometry with Special Application to Electric Lighting: Dr. A. Palaz, translated by G. W. and M. R. Patterson (Low).—Bulletin of the U.S. Fish Commission, Vol. xii. (Washington).—Chemical Laboratory Labels, Part 2: W. H. Symons (Gallenkaemp).—Brasilische Pilzblumen: A. Möller (Jena, Fischer).—Elliott Brothers' Catalogue: No. E4 (Elliott).—A Fisherman's Fancies: F. B. Doveton (Stock).—Calendar of the Department of Science and Art, 1895 (Eyre and Spottiswoode).

PAMPHLETS.—On the Present Relations of Agricultural Art and Natural Science: Prof. R. Warington (Frowde).—Bibliography of Aceto Acetic Ester and its Derivations: P. H. Seymour (Washington).—Geology of the Boston Basin: W. O. Crosby, Vol. 1, Part 2 (Boston).—North American Bows, Arrows, and Quivers: O. T. Mason (Washington).—Quelques Aperçus sur l'Esthétique des Formes: C. Henry (Paris, Nony).

SERIALS.—Quarterly Journal of the Geological Society, Vol. li. Part 1, No. 201 (Longmans).—Transactions of the English Arboricultural Society, Vol. 3, Part 4 (Carlisle).—Psychologische Arbeiten, Erster Band, 1 Heft (Leipzig, Engelmann).—American Journal of Mathematics, Vol. xvii. No. 1 (Baltimore).—Bulletin of the American Mathematical Society, January (New York, Macmillan).—Bulletin de la Société Impériale des Naturalistes de Moscou, 1894, No. 3 (Moscou).—Proceedings of the Physical Society of London, Vol. xiii. Part 3 (Taylor and Francis).—Proceedings of the Academy of Natural Sciences of Philadelphia, 1894, Part 2 (Philadelphia).—Bulletin of the Buffalo Society of Natural Sciences, Vol. v. No. 4 (Buffalo).—Bulletin de L'Académie Impériale des Sciences de St. Pétersbourg, January (St. Pétersbourg).—U.S. Department of Agriculture (Division of Chemistry), Bulletins Nos. 41–43 (Washington).—Proceedings of the Boston Society of Natural History, Vol. xxvi. Parts 2 and 3 (Boston).—American Journal of Science, February (New Haven).—Medical Magazine, February (Strand).—Journal of the Academy of Natural Sciences of Philadelphia, 2nd series, Vol. x. Part 2 (Philadelphia).—Strand Magazine, February (Newnes).—Strand Musical Magazine, February (Newnes).—Picture Magazine, February (Newnes).—Science Progress, February (Scientific Press, Ltd.).—Bulletin of the Geological Institution of the University of Upsala, Vol. 1, Nos. 1 and 2 (Upsala).

CONTENTS.

PAGE
Electric Oscillations. By **Prof. A. Gray** 361
The Book of the Rose. By **W.** 362
Our Book Shelf:—
  Wagner: "L'Industrie des Araneina." (*Illustrated*). **R. I. P.** 363
  Hewitt: "Elementary Practical Chemistry, Inorganic and Organic" 364
  Murray: "How to Live in Tropical Africa" 364
Letters to the Editor:—
  The Liquefaction of Gases.—**M. M. Pattison Muir; Prof. James Dewar, F.R.S.** 364
  Vertebrate Segmentation.—**P. Chalmers Mitchell** . 367
  The Black-veined White Butterfly.—**W. Warde Fowler** 367
  Parrots in the Philippine Islands.—**Prof. Alfred Newton, F.R.S.** 367
Twenty-five Years of Geological Progress in Britain. By **Sir Archibald Geikie, F.R.S.** 367
Notes 370
Our Astronomical Column:—
  The Mass of the Asteroids 373
  The Apparent Diameters of Mercury 373
  The Variation of Latitude 373
The Sun's Place in Nature. I. (*Illustrated.*) By **J. Norman Lockyer, C.B., F.R.S.** 374
The Institution of Mechanical Engineers. 377
The Advance of Technical Education. By **R. A. Gregory** 379
Science in the Magazines 380
University and Educational Intelligence 382
Societies and Academies 383
Books, Pamphlets, and Serials Received 384

© 1895 Nature Publishing Group